The Monthly Evening Sky Map

A SCIENTIFIC JOURNAL AND EDUCATIONAL GUIDE IN ASTRONOMY FOR THE AMATEUR

Founded in 1905 by Leon Barritt

ALSO A STAR, CONSTELLATION AND PLANET FINDER MAP ARRANGED FOR THE CURRENT MONTHS - MORNING AND EVENING - AND PRACTICAL ANYWHERE IN THE WORLD

PUBLISHED QUARTERLY

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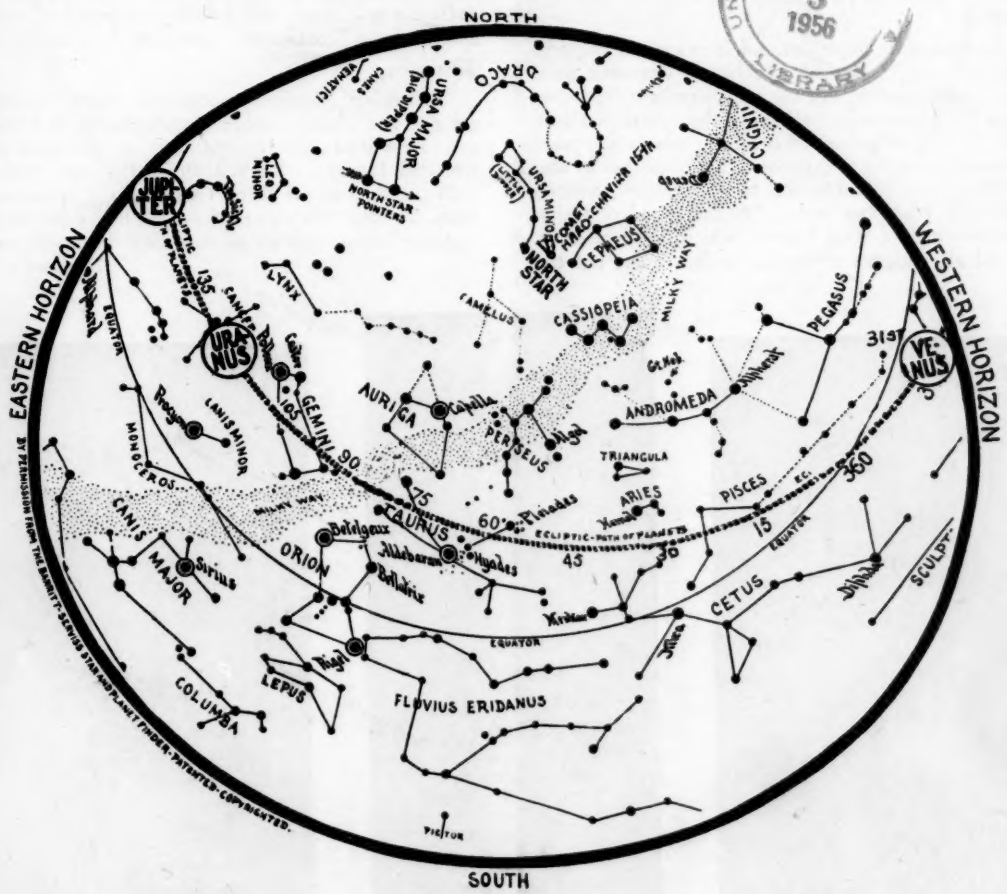
EVENING SKY MAP FOR JANUARY



AT 9:00 P.M., JAN. 1 8:00 P.M., JAN. 15 7:00 P.M., JAN. 31

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper.

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

XUM

NEBULAE AND STAR CLUSTERS

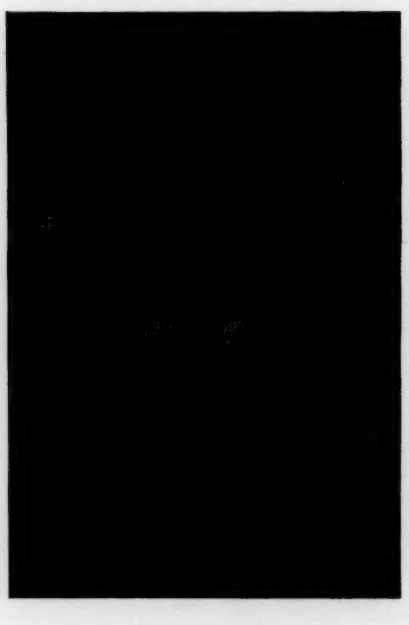
We propose herein to acquaint (or re-acquaint) our readers with some of the brighter, more readily observable nebulae and star clusters. For this purpose we are re-printing Messier's famous catalog, which aside from its historical value, is a rich source of material in this field.

The heavens abound with nebulae and star clusters. Some are objects bright enough to be apparent to the naked eye, some are visible telescopically, while others can be picked up only from the photograph plate exposed in the great telescopes. The ancients recognized the nebulous *(cloudy)* appearance of a few objects, including Praesepe, the Great Nebula of Andromeda, and the Double Cluster of Perseus. Then the introduction of the telescope as the tool of the astronomer led to new discoveries which included, surprisingly enough, the marvelous Nebula of Orion in the 17th century, which, though visible to the naked eye, had apparently never previously been noted as nebulous. Late in the 18th century the French astronomer, Messier, published the first catalog of nebulae and clusters - - a list of 103 objects compiled specifically to simplify the work of comet hunters (nebulae, particularly, can easily be mistaken for a comet).

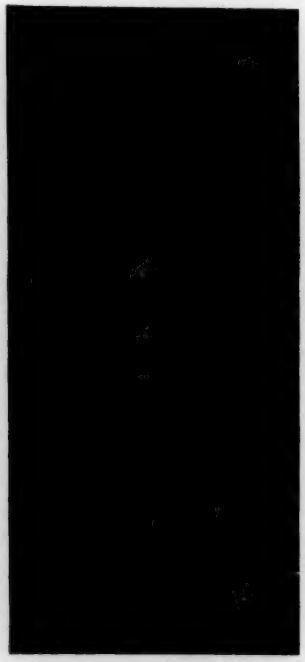
As telescopes were improved and increased in size and performance, more objects of a nebulous character were discovered, while certain known ones were resolved into stars. This led astronomers to believe that possibly all of them were actually collections of stars, the nebulous appearance stemming from the limitations of the telescopes in use. In fact, Olmstead's "Introduction to Astronomy", written only about 100 years ago, states: "In the sword of Orion is a celebrated nebula, long known, which, until recently, had resisted all attempts to resolve it into stars; but the great reflector of Lord Rosse, and more recently the great refractor of the Cambridge observatory, have succeeded in a partial resolution, at least, of this grand object, and have authorized the anticipation that, with a small increase of telescopic power, the whole will be shown to consist of an immense collection of exceedingly minute stars." In this same volume appears this statement: "Astronomers at present, include all resolveable nebulae under the head of clusters, appropriating the term nebulae exclusively to such of these bodies as have never been resolved. The question whether this distinction is not merely relative to the powers of the telescope, and whether, on the increase of these powers this class of bodies would not all be resolved into stars, is not easily determinded, since the same increase of telescopic power which converts existing nebulae into clusters, brings to light a greater number of those which are irresolveable." It remained for Sir William Huggins about a decade later (1864) to demonstrate the fact that there were indeed true gaseous nebulae as contrasted with those nebulous-appearing objects actually composed of a myriad of individual stars. He made his discovery upon the application of the spectroscope to a bright "planetary" nebula in Draco, finding, to his amazement, that the spectrum revealed only a single line, the type spectrum of a radiating gas. Stars, and nebulae composed of stars, gave by contrast a "continuous" spectrum - - a totally different type.

Following Messier's pioneering effort in cataloging nebulae and clusters, other observers compiled small lists and individual observations, but it remained for the Herschel family - - Sir William in the early 19th century with the help of his sister, Caroline, and subsequently Sir John, his son, who extended Sir William's program to the southern hemisphere - - to undertake the systematic obser-

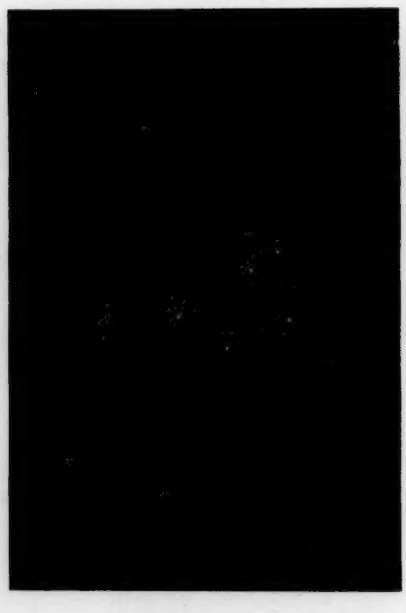
(continued on page 8)



N.G.C. 869 & 884—the famed "Double Cluster" in Perseus.



N.G.C. 1976 (Messier 42)—the "Great Nebula of Orion"

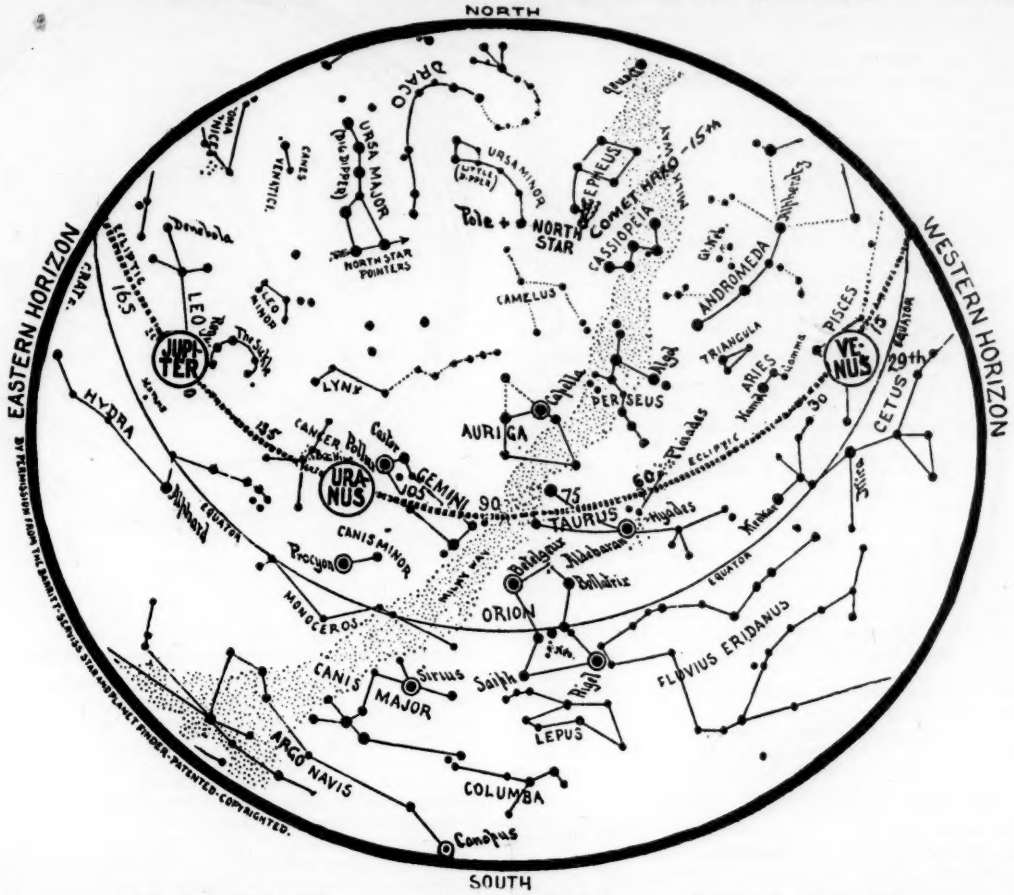


Messier 45—The Pleiades, in Taurus

AN EXCELLENT REPRESENTATION OF THE APPEARANCE OF THREE FAMOUS MEMBERS OF THE GROUP KNOWN AS NEBULAE AND CLUSTERS, AS SEEN IN BINOCULARS OR VERY SMALL TELESCOPES. PHOTOGRAPHS BY JOHN LEICHT.

XUM

EVENING SKY MAP FOR FEBRUARY



AT 9:00 P.M., FEB. 1 8:00 P.M., FEB. 15 7:00 P.M., FEB. 29

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper. This map is arraanged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.

PROGRESS ON SATELLITE PROJECT

The first step has been taken to bring to reality the plans of the United States Government, reported in the last issue of the "Map", to build and launch a man-made satellite about the earth. The U.S. Defense Department announced in October, 1955 that the Glenn L. Martin Company of Baltimore has been awarded a two million dollar contract to turn out the launching vehicle, for the satellite. Other companies will be brought into the construction as the work advances. Mentioned to build the rocket motor for the first propulsion stage is the General Electric Company.

The entire satellite program has been named "Project Vanguard" and has been put under the Navy Department. Designation of the Navy Department was made because of their extensive experience with guided missiles, and has nothing to do with the purpose of the project which is research into the nature of the outer atmosphere.

The satellite, to be launched by multi-stage rocket, will travel in an elliptical path relatively close to the earth (probably as close as two hundred miles when nearest its primary) and will complete a revolution in about an hour and one half. The present schedule calls for launching within two years.

COMET VISIBILTY

The list of observable comets has diminished sharply. Though discoveries of nine comets were announced during 1955, with two reaching approximate naked eye visibility, all are now receding from the earth and accordingly decreasing in brightness. Several can still be picked up in the large telescopes, including a most unusual comet, Haro-Chavira (1954k). Discovered in 1954, this comet does not make its closest approach to the Sun *(perihelion)* until about January 20th of this year - - at the great distance of 380,000,000 miles. A search through the *Comet Catalogue* of A. C. D. Crommelin back as far as 1746 reveals only one comet (Schain-Comas Sola, discovered in 1925) to have a greater perihelion distance. Though it will be slightly closer to the earth than the Sun when it comes to perihelion, it is destined to remain a faint comet. Its predicted magnitude is 13.

The Harvard College Observatory announced the discovery of another comet by Mrkos. On October 19th he picked up a 9th magnitude comet in Cancer, a few degrees south-west of Delta Cancri. Subsequent investigation revealed this to be the periodic comet Perrine (1896 VII).

(continued on page 10)

XUM

The

Monthly Evening Sky Map

FOUNDED IN 1905 BY LEON BARRITT

MRS. LEON BARRITT, Editor
Irving L. Meyer, Managing Editor

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All time is expressed in Eastern (75th Meridian) Standard Time.
Add five hours to convert to Greenwich Civil Time.

AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

JANUARY 1956

THE SUN: is deep in the southern heavens, opening the month in Sagittarius, and moving into central Capricornus by month-end. It is closest to the earth (the earth's *perihelion*) the 2nd at 91.3 million miles distance.

THE MOON: is at apogee (farthest from the earth) the 11th at 253,000 miles, and is at perigee (closest to the earth) the 26th at 223,000 miles.

Libration: Maximum exposure of the region on the Moon's limbs takes place as follows:

January	3	North limb, 6.8°
	4	West limb, 7.9°
	18	South limb, 6.7°
	20	East limb, 7.0°
	30	North limb, 6.6°

The Moon's Phases (E.S.T.):

Last Quarter	January	4 at 5:41 pm
New Moon		12 at 10:01 pm
First Quarter		20 at 5:58 pm
Full Moon		27 at 9:40 am

MERCURY: opens the month on the Sagittarius - - Capricornus boundary, in the evening sky. On the 11th it reaches greatest elongation east of the Sun, 19° 1', and will be observable in the evening twilight zone, just after sunset.It will be magnitude -0.4, making it a bright object though subdued by the bright twilght; telescopically it will appear gibbous (61% illuminated) and 7" in diameter. The period of observation is limited to only a few days around the 11th because of Mercury's rapid motion; by the 27th it is in inferior conjunction with the Sun, and moves into Capricornus in the morning sky. Minimum geocentric distance, 61 million miles, is reached the 29th.

VENUS: is in the evening sky in Capricornus on the 1st. Its rapid motion carries it north-eastwardly along the ecliptic to a point in Aquarius just below the equator, by the end of the month. It is very favorably placed for observation, particularly from the northern hemisphere. Magnitude is -3.4 during the month, outshining every other star-like object many times. In the telescope it is gibbous, and around 13" in apparent diameter. Distance from the earth is decreasing, being 129 million miles the 1st, against 114 million miles the 31st.

MARS: is now well placed for observation, but in the late morning sky. It moves from Libra into Scorpio, passing 1½° south of Saturn on the 14th. On that date Saturn will shine at almost a magnitude brighter than Mars, which is still very remote from the earth. In the telescope, Mars also will look somewhat gibbous (though closer to round than Mercury or Venus), but its apparent disc is so small - - about 5" in diameter - - that only powerful telescopes will reveal any detail. Distance is decreasing - - from 194 million miles the 1st to 171 million miles the 31st.

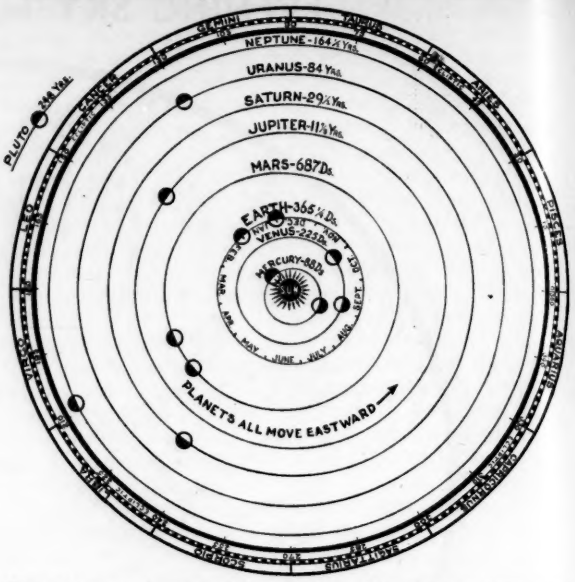
JUPITER: moves slowly in Leo, close to the first-magnitude star, Regulus. In fact, at the end of the month it is only a little more than a half degree north of Regulus. At the middle of the month, Jupiter's magnitude is -2.0, equatorial diameter 43" (with polar diameter about 3" less, readily noticeable in small telescopes), and geocentric distance 421 million miles. It is well placed for observation, as it rises shortly after sunset. Even opera glasses will show the four bright satellites, and small telescopes will reveal the cloud bands across the disc.

SATURN: In Scorpio, can be observed in the late morning sky. It is still some time from opposition, and consequently will become brighter and appear larger in the telescope as the season advances. The rings, which appear about 36" in apparent diameter, are readily observable in small telescopes. Distance the 15th is 975 million miles.

URANUS: after a dearth of several months, we finally have a planet coming to opposition. Uranus accomplishes this on the 21st from a point in the heavens close to Praesepe in Cancer. Well placed for observation, it is, unfortunately, a faint planet of the 6th magnitude, barely visible to the naked eye. In the telescope moderate magnification (50 diameters and up) will show a tiny, round disc, 4" indiameter. It is closest to the earth the 22nd at 1635 million miles.

NEPTUNE: a true telescopic object, it moves very slowly in Virgo in the morning sky. It rises shortly after midnight. Though fairly well placed for observation, it is hardly a rewarding sight, since a 12-inch telescope will only show a very small, dull disc. Distance the 15th is 2826 million miles.

HELIOCENTRIC POSITIONS OF THE PLANETS, JANUARY



The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month are given for Mercury, Venus, Earth, and Mars. The arrow indicates the last day of the month. Jupiter, Saturn, Uranus, Neptune, and Pluto are shown in their mean position for the current month.

LUNAR LIBRATION

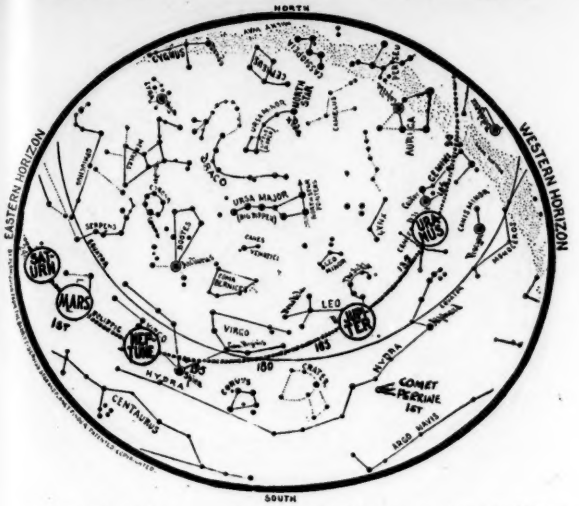
Though the Moon always keeps the same side turned toward the earth, *libration* permits us to observe a small additional area at each limb, for a total of about 59% of the lunar surface. *Libration* results largely from two circumstances: irregularities in the Moon's motion about the earth (affecting the east and west limbs); and inclination of the Moon's pole of rotation to the plane of its orbit about the earth (affecting the north and south limbs).

With this issue, we are giving the dates of maximum exposure of the limbs, along with the amount of this exposure, expressed in degrees. See "The Amateur's Forum".

SOLAR AND LUNAR ECLIPSES IN 1956

During the year there will be four eclipses, two of the Sun and two of the Moon. The solar eclipses occur on June 8th, with visibility limited to the south Pacific Ocean, and December 2nd, with visibility limited to Europe, Asia, and the Middle East. The first is a total eclipse, the second a partial. Of the lunar eclipses, the first is a 97% partial pretty much invisible in the western hemisphere; the second is a total, with over an hour's duration, on the 18th of November, visible over the entire western hemisphere. More details of these eclipses will be given in the appropriate issues of the "Map".

MORNING SKY MAP FOR JANUARY



At 5:00 A.M., JAN. 1; 4:00 A.M., JAN. 15; 3:00 A.M., JAN. 31

PLANETARY CONFIGURATIONS

Eastern Standard Time

JANUARY 1956

January	1— 6:24 pm	Conjunction, Jupiter and Moon; Jupiter north 6° 33'
	2— 8:— am	Earth in perihelion
	6— 5:22 am	Conjunction, Neptune and Moon; Neptune north 5° 47'
	8— 6:14 am	Conjunction, Mars and Moon; Mars north 2° 25'
	8— 1:20 pm	Conjunction, Saturn and Moon; Saturn north 3° 35'
	11— 1:— pm	Mercury greatest elongation east, 19° 1'
	14— 1:— pm	Mercury in ascending node
	14— 4:— pm	Conjunction, Mars and Saturn; Mars south 1° 33'
	14— 5:11 pm	Conjunction, Mercury and Moon; Mercury south 4° 27'
	16— 3:37 am	Conjunction, Venus and Moon; Venus south 7° 3'
	18—12:— om	Mercury stationary in Right Ascension
	19— 4:— am	Mercury in perihelion
	21— 4:— am	Opposition, Uranus and Sun
	21— 6:— am	Quadrature, Neptune and Sun
	27—12:37 am	Conjunction, Uranus and Moon; Uranus north 4° 18'
	27— 9:— am	Inferior conjunction, Mercury and Sun; Mercury north 3° 24'
	29— 1:03 am	Conjunction, Jupiter and Moon; Jupiter north 6° 28'
	29—10:— am	Mercury greatest heliocentric latitude north

AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

FEBRUARY 1956

THE SUN: continues its progress toward the northern heavens, moving from Capricornus into Aquarius. On the 1st it is 91.5 million miles away; by the 29th it is 92.0 million miles away.

THE MOON: is farthest from the earth the 7th at 252,000 miles, and is closest the 23rd at 226,000 miles.

Libration: Maximum exposure of the region on the Moon's limbs takes place as follows:

February	1	West limb, 7.4°
	14	South limb, 6.6°
	16	East limb, 5.8°
	27	North limb, 6.5°

The Moon's Phases (E.S.T.):

Last Quarter	February 3 at 11:08 am
New Moon	11 at 4:38 pm
First Quarter	19 at 4:21 am
Full Moon	25 at 8:41 pm

(continued on page 6)

SATELLITES OF JUPITER

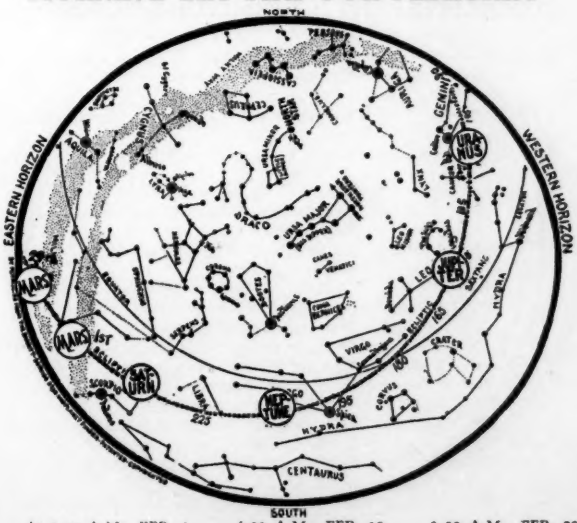
JANUARY

Day	West						East						
0		·4		·3		·1	○	2·					
1			·4		·3	2·	○	1·					
2				·4		·2	○	·3					·1●
3					·4	1·	○		·2	·3			
4							○	·1 3·		3·			·4●
5					2·	1·	○	3·	·4				
6					3·		○	1·			·4		·2●
7				3·		·1	○		2·			·4	
8					·3	2·	○	1·				·4	
9					·2		○	·3 4·				4·	
10	○1·						○		·2	·3	4·		
11							○	·1 2·		4· 3·			
12					2·	1·	○	4· 3·					
13					3· 4·		·2	○	·1				
14				4· 3·		·1	○		·2				
15			4·		·3	2·	○	1·					
16		4·			·2	·1	○						·3●
17	○1·		·4				○		·2	·3			
18			·4				○	·1	2·	3·			
19				·4		2· 1·	○		3·				
20						4· 3·	·2	○	·1				
21				3·		1·	○	·4	·2				
22	○2·				·3		○	1·		·4			
23						·2	·1	○				·4	·3●
24								○ 1·	·2	·3		·4	
25								○	2·	3·		4·	·1●
26						2·	1·	○	3·			4·	
27							2· 3·	○	·1		4·		
28				3·		1·	○			2· 4·			
29	○4·			·3			2○	· 1·					
30					4· 3·		·1	·3 ○					
31			4·				○	2· 1·	·3				

Appearance of Jupiter and its satellites at 2:45 A.M., E.S.T. as seen in an inverting telescope

Jupiter is represented by the disc in the center of the chart, and each satellite by a dot and its appropriate number. The direction of the satellite's motion is from the dot toward the numeral. The numeral and light disc at the left margin of the chart indicates a satellite in transit across Jupiter's disc; the numeral and dark disc at the right margin indicates a satellite which is invisible because it is being eclipsed or occulted by Jupiter. This chart must be held upside down if binoculars, opera glasses, or an erecting type telescope is used.

MORNING SKY MAP FOR FEBRUARY



At 5:00 A.M., FEB. 1; 4:00 A.M., FEB. 15; 3:00 A.M., FEB. 29

(continued from page 5)

MERCURY: remains a morning star in Capricornus all month. This planet remains close to the Sun always and is, therefor, a difficult object to observe. In fact, it can only be observed for a few days around the dates of maximum elongation from the Sun, and then in the orange-red twilight zone. This month greatest western elongation (26° 34') occurs on the 21st. On that date the planet will appear somewhat more than half illuminated (as seen in the telescope), and magnitude will be -0.3. Its geocentric distance is increasing rapidly - - from 62 million miles the 1st to 100 million miles the 29th.

VENUS: is most favorably located in the evening sky. During the month it crosses the equator into the northern hemisphere, traveling from Aquarius into Pisces. Venus is easily identified by looking to the west as the sky darkens - - then it will appear as a brilliant gem of magnitude -3.6. On the 1st it is 113 million miles away, apparent diameter is 14", and it is 79% illuminated (*Gibbous*); on the 29th, distance is 96 million miles, diameter 16", and illumination is 70%.

MARS: is well on its way to assuming prominence in the morning sky, moving from Scorpio into Sagittarius. Though it rises after midnight, it will be well placed for observation before dawn breaks. However, it is still so far from the earth (170 million miles the 1st, and 147 million miles the 29th) that it will shine no brighter than a standard first magnitude star; and in the telescope high powers will be required to reveal any details on its 5" diameter disc. Later in the year this ruddy planet will make one of its closest approaches to the earth.

JUPITER: remains close to Regulus in Leo, and on the 16th is at opposition, thereupon entering the evening sky. Jupiter is a magnificient sight; to the naked eye its magnitude of -2.1 dwarfs all other stellar objects but Venus; in the telescope it is a grand sight. Its great disc is 45" in apparent diameter, noticeably flattened at the poles. The most moderate optical aid will reveal the four bright satellites, and a small telescope will show up the reddish band markings. It is closest to the earth the 16th at 407 million miles distance.

SATURN: is another morning sky object. It is in Scorpio the entire month, rising shortly after midnight. Though not yet as well placed for observation as it will be in later in the year, it still repays the efforts of the observer who trains a telescope on it just before dawn. The ring system is remarkable, and unique, and well within the grasp of a small telescope. On the 15th, it shines at magnitude -0.7, over a distance of 931 million miles.

URANUS: holds forth in the night skies in Cancer. Though it is primarily a telescope object an alert observer can see it with the unaided eye if the night is very clear and moonless. The telescope shows a tiny, round disc of a greenish hue. Distance the 15th is 1641 million miles.

NEPTUNE: is also a morning sky object. It is in Virgo, and rises before midnight. However, it is so faint that it is a very unimpressive object. It can be detected with good binoculars. Distance the 15th is 2777 million miles.

PLUTO: this most remote of the known major planets comes to opposition on the 16th, not many hours after Jupiter. Like Jupiter, it is in Leo, but is high in the *Sickle*. Pluto is exceedingly faint and can be observed only with fairly large telescopes. Its magnitude is of the order of 14. It is closest to the earth the 20th at 3141 million miles.

PLANETARY CONFIGURATIONS

Eastern Standard Time — FEBRUARY 1956

February	1— 7:— pm	Neptune stationary in Right Ascension
	2— 1:03 pm	Conjunction, Neptune and Moon; Neptune north 5° 36'
	5—12:01 am	Conjunction, Saturn and Moon; Saturn north 3° 16'
	6— 2:01 am	Conjunction, Mars and Moon; Mars north 0° 15'
	8—12:— am	Mercury stationary in Right Ascension
	9— 4:43 pm	Conjunction, Mercury and Moon; Mercury south 1° 9'
	15— 6:03 am	Conjunction, Venus and Moon; Venus south 5° 32'
	16—12:— am	Opposition, Jupiter and Sun
	16— 8:— pm	Opposition, Pluto and Sun
	21— 1:— am	Mars in descending node
	21— 5:— am	Merucry greatest elongation west, 26° 34'
	21— 8:— pm	Mercury in descending node
	21—11:— pm	Quadrature, Saturn and Sun
	22— 8:— am	Venus in ascending node
	23— 8:55 am	Conjunction, Uranus and Moon; Uranus north 4° 18'
	25— 5:57 am	Conjunction, Jupiter and Moon; Jupiter north 6° 22'
	29— 9:36 pm	Conjunction, Neptune and Moon; Neptune north 5° 24'

MORNING SKY MAP FOR MARCH

At 5:00 A.M., MAR. 1; 4:00 A.M., MAR. 15; 3:00 A.M., MAR. 31

SATELLITES OF JUPITER

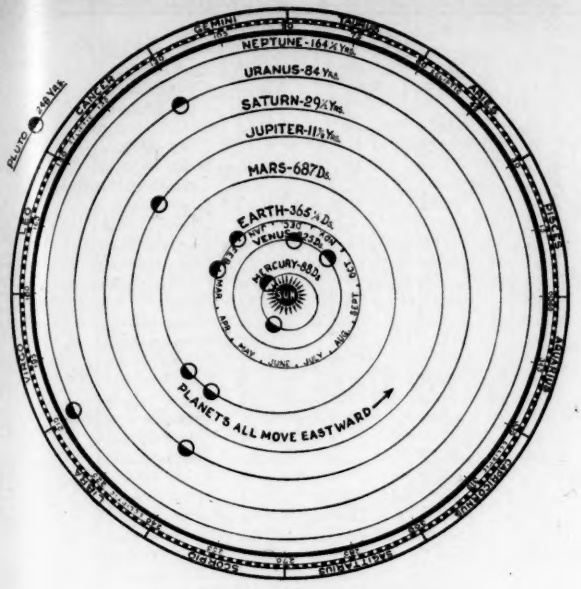
FEBRUARY

Day	West	East
1	·4 ·1○ 2· ·3	
2	○1· 4· 2· ○ 3·	
3	·4 ·2 3·○·1	
4	·4 3· 1· ○ ·2	
5	·3·4 ○ 2··1	
6	2· ·1 ·4 ○	
7	○ 1· ·4 ·3	·2●
8	·1 ○ 2· ·3	
9	2· 1○· 3· ·4	
10	○3· ·2 ○	·4 ·1●
11	3· 1·○ ·2	4·
12	·3 ○ ·1 2·	4·
13	2· ·3 1· ○	4·
14	·2○ ·3 1· ·4	
15	·1 ·4 ○ ·2 ·3	
16	4· 2·○ 1· 3·	
17	4· ·2 ○3·	·1●
18	4· 3· 1·○ ·2	
19	·4 ·3 ○ ·1 2·	
20	·4 ·3 2· 1· ○	
21	·4 ·2 ○ ·3 ·1	
22	·4 ·1 ○ ·2 ·3	
23	○2· ○ 1· 3·	·4●
24	·2 ·1○ 3· ·4	
25	○1· 3· ○ ·2 ·4	
26	3· ○ ·1 2·	·4
27	·3 2· 1· ○	·4
28	·2 ○ ·1	4· ·3●
29	·1 ○ ·2 ·3 4·	

Appearance of Jupiter and its satellites at 1:15 A.M., E.S.T. as seen in an inverting telescope

Your address, as printed on the mailing wrapper, contains your expiration information—the first digit is the *issue number*, followed by the year. For example, "2-57" means that the last issue of the subscription would be the second (April-May-June) of 1957. If there is any discrepancy in expiration, or address, kindly advise.

HELIOCENTRIC POSITIONS OF THE PLANETS, FEBRUARY



AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

MARCH 1956

THE SUN: is in Aquarius on the 1st at a distance of 92.1 million miles. It moves north-eastwardly during the month, crosses the equator on the 20th, and by the 31st is well to the north, and at a distance of 92.8 million miles.

THE MOON: is at apogee (farthest from the earth) the 6th at a distance of 251,000 miles; perigee takes place on the 21st at 229,000 miles.

Libration: Maximum exposure of the region on the Moon's limbs takes place as follows:

March 1 West limb, 6.3°
12 South limb, 6.6°
13 East limb, 5.0°
25 North limb, 6.6°
28 West limb, 5.3°

The Moon's Phases (E.S.T.):

Last Quarter	March 4 at 6:53 am
New Moon	12 at 8:36 am
First Quarter	19 at 12:13 pm
Full Moon	26 at 8:11 am

MERCURY: travels from Capricornus through Aquarius to a point just north of the equator in Pisces. It is too close to the Sun the entire month to be observable. It is in the morning sky the entire time. It is 102 million miles away the 1st, but by the 31st this span has widened to 125 million miles.

VENUS: is a striking object in the early evening sky. It leaves Pisces, crosses Aries and winds up the month at a point a few degrees south-west of the Pleiades, in Taurus. On the first it is 96 million miles from the earth, apparent diameter is 16", magnitude is -3.6, and the disc is 70% illuminated as seen from earth; by the 31st, distance is 75 million miles, diameter 21", magnitude -3.9, and illumination of the disc 57%. Venus will glow brilliantly in the night sky; in the telescope, even the smallest, its slightly gibbous disc will be readily apparent (and best observed in broad daylight or before it becomes completely dark).

MARS: continues to come nearer the earth, and consequently to appear brighter, and as seen in the telescope, larger. It is in Sagittarius, best seen from the southern hemisphere, in the morning sky, rising a few hours before the Sun. It is 146 million miles from the earth the 1st, and 121 million miles the 31st, causing magnitude to increase from 1.2 to 0.8. Though the disc is only about 6" in diameter during the month, a moderate telescopic magnification will show that Mars is decidedly gibbous (88% illuminated at month end).

JUPITER: is the many times brighter twin of the first-magnitude star Regulus, in Leo. It sets a short time before dawn, so is very well placed for observation. On the 15th it is 418 million miles away from the earth, but is such a giant among the planets that its magnitude is -2.0 and its apparent equatorial diameter is 44". It is a fine sight as seen with any optical aid; as telescopic power increases more detail becomes visible, such as the bands across the disc. The four bright satellites are very easy objects.

SATURN: is in Scorpio in the morning sky, rising at about midnight. It is still approaching the earth but is so remote at any time that changes in apparent size and magnitude are not particularly great. On the 15th: geocentric distance, 887 million miles; ring diameter, 39"; and magitude, 0.6. The rings are a splendid sight, as they are widely opened as seen from the earth (at times we see them edgewise and they are so thin as to be invisible.)

URANUS: is in Cancer, close to the Gemini border. Still very well situated for observation, this faint planet sets an hour or two after midnight. To the naked eye it is very unimpressive since it can just be made out; a twelve-inch telescope shows a tiny disc of a bright, greenish color. Distance the 15th is 1673 million miles.

NEPTUNE: moves very slowly in Virgo, rising shortly after midnight. Though well located for observation, its exceeding remoteness renders it invisible to the naked eye. Its magnitude is 8., so some telescopic assistance is required just to see the planet. Distance the middle of the month is 2741 million miles.

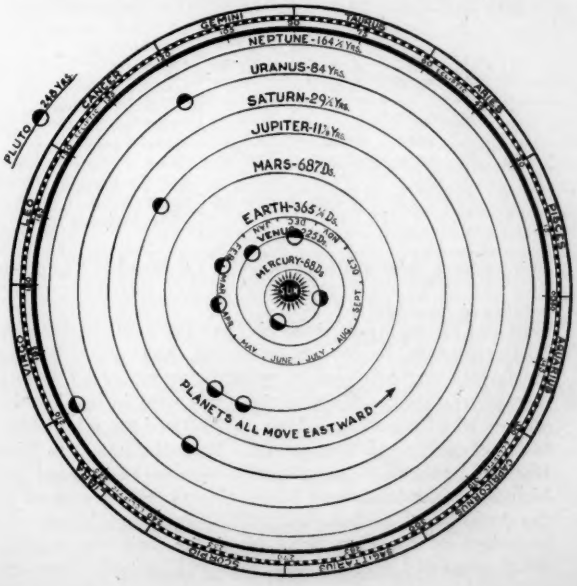
PLANETARY CONFIGURATIONS

Eastern Standard Time

MARCH 1956

March	3— 3:— am	Mercury in aphelion
	3— 9:44 am	Conjunction, Saturn and Moon; Saturn north 2° 59'
	6—12:11 am	Conjunction, Mars and Moon; Mars south 2° 6'
	10— 6:56 pm	Conjunction, Mercury and Moon; Mercury south 7° 26'
	12— 6:— am	Saturn stationary in Right Ascension
	15—10:41 pm	Conjunction, Venus and Moon; Venus south 1° 7'
	20—10:21 am	Sun enters Aries; Equinox
	21— 3:11 pm	Conjunction, Uranus and Moon; Uranus north 4° 27'
	23— 9:41 am	Conjunction, Jupiter and Moon; Jupiter north 6° 21'
	23—11:— am	Mercury greatest heliocentric latitude south
	27—12:— am	Venus in perihelion
	28— 6:02 am	Conjunction, Neptune and Moon; Neptune north 5° 17'
	30— 5:55 pm	Conjunction, Saturn and Moon; Saturn north 2° 50'

HELIOCENTRIC POSITIONS OF THE PLANETS, MARCH



MESSIER'S CATALOGUE OF CLUSTERS AND NEBULAE

Messier	N.G.C.	R.A. (1900)	Dec. (1900)	Description
1	1952	5 28.5	+21 57	Diffuse nebula—The Crab nebula in Taurus
2	7089	21 28.3	— 1 16	Globular cluster
3	5272	13 37.6	+28 53	Globular cluster
4	6121	16 17.5	—26 17	Globular cluster
5	5904	15 13.5	+ 2 27	Globular cluster
6	6405	17 33.5	—32 9	Open cluster
7	6475	17 47.3	—34 47	Open cluster
8	6523	17 57.6	—24 23	Diffuse nebula—The Lagoon nebula—very large
9	6333	17 13.3	—18 25	Globular cluster
10	6254	16 51.9	— 3 57	Globular cluster
11	6705	18 45.7	— 6 23	Open cluster
12	6218	16 42.0	— 1 46	Globular cluster
13	6205	16 38.1	+36 39	Globular cluster—The Hercules cluster—best example
14	6402	17 32.4	— 3 11	Globular cluster
15	7078	21 25.2	+11 44	Globular-cluster
16	6611	18 13.2	—13 49	Open cluster
17	6618	18 15.0	—16 13	Diffuse nebula—The Horseshoe or Omega nebula—bright
18	6613	18 14.1	—17 10	Open cluster
19	6273	16 56.4	—26 7	Globular cluster
20	6514	17 56.3	—23 2	Diffuse nebula—The Trifid nebula—bright
21	6531	17 58.6	—22 30	Open cluster
22	6656	18 30.3	—23 59	Globular cluster
23	6494	17 51.0	—19 0	Open cluster
24	6603	18 12.6	—18 27	Open cluster
25	I.C.4725	18 25.8	—19 19	Open cluster
26	6694	18 39.8	— 9 30	Open cluster
27	6853	19 55.3	+22 27	Planetary nebula—The Dumb-bell nebula
28	6626	18 18.4	—24 25	Globular cluster
29	6913	20 20.3	+38 12	Open cluster
30	7099	21 34.7	—23 38	Globular cluster
31	224	0 37.3	+40 43	Spiral nebula—The Andromeda nebula—largest spiral
32	221	0 37.2	+40 19	Spiral nebula—Very close to M31 much smaller
33	598	1 28.2	+30 9	Spiral nebula
34	1039	2 35.6	+42 21	Open cluster
35	2168	6 2.7	+24 21	Open cluster
36	1960	5 29.5	+34 4	Open cluster
37	2099	5 45.8	+32 31	Open cluster
38	1912	5 22.0	+35 45	Open cluster
39	7092	21 28.6	+48 0	Open cluster
40	.....	12 17.4	+58 40	Two faint stars mistaken for a nebula by Messier
41	2287	6 42.7	—20 38	Open cluster
42	1976	5 30.4	— 5 27	Diffuse nebula—The Orion nebula—very bright
43	1982	5 30.6	— 5 20	Diffuse nebula
44	2632	8 34.3	+20 20	Open cluster—Praesepe or the Beehive cluster
45	.....	3 41.5	+23 48	Open cluster—The Pleiades
46	2437	7 37.2	—14 35	Open cluster
47	2478	7 50.2	—15 9	Open cluster
48	.....	8 9.0	— 1 39	Open cluster
49	4472	12 24.7	+ 8 33	Spiral nebula
50	2323	6 58.2	— 8 12	Open cluster
51	5194	13 25.7	+47 43	Spiral nebula—The Whirlpool nebula
52	7654	23 19.8	+61 3	Open cluster
53	5024	13 8.0	+18 42	Globular cluster
54	6715	18 48.7	—30 36	Globular cluster
55	6809	19 33.7	—31 10	Globular cluster
56	6779	19 12.7	+30 0	Globular cluster
57	6720	18 49.9	+32 54	Planetary nebula—The Ring nebula in Lyra
58	4579	12 32.7	+12 22	Spiral nebula
59	4621	12 37.0	+12 12	Spiral nebula
60	4649	12 38.6	+12 6	Spiral nebula
61	4303	12 16.8	+ 5 2	Spiral nebula
62	6266	16 54.8	—29 58	Globular cluster
63	5055	13 11.3	+42 34	Spiral nebula
64	4826	12 51.8	+22 13	Spiral nebula
65	3623	11 13.7	+13 38	Spiral nebula
66	3627	11 15.0	+13 32	Spiral nebula
67	2682	8 45.8	+12 11	Open cluster
68	4590	12 34.2	—26 12	Globular cluster
69	6637	18 24.8	—32 25	Globular cluster
70	6681	18 36.7	—32 23	Globular cluster
71	6838	19 49.3	+18 31	Open cluster
72	6981	20 48.0	—12 55	Globular cluster
73	6994	20 53.5	—13 1	Open cluster
74	628	1 31.3	+15 16	Spiral nebula
75	6864	20 0.2	—22 12	Globular cluster
76	650	1 36.0	+51 4	Planetary nebula
77	1068	2 37.6	— 0 26	Spiral nebula
78	2068	5 41.6	+ 0 1	Diffuse nebula
79	1904	5 20.1	—24 37	Globular cluster
80	6093	16 11.1	—22 44	Globular cluster
81	3031	9 47.3	+69 32	Spiral nebula
82	3034	9 47.5	+70 10	Spiral nebula
83	5236	13 31.4	—29 21	Spiral nebula
84	4374	12 20.0	+13 26	Spiral nebula
85	4382	12 20.4	+18 45	Spiral nebula
86	4406	12 21.1	+13 30	Spiral nebula
87	4486	12 25.8	+12 57	Spiral nebula
88	4501	12 26.9	+14 58	Spiral nebula
89	4552	12 30.6	+13 6	Spiral nebula
90	4569	12 31.8	+13 43	Spiral nebula
91	.....	12 36.0	+13 50	Not confirmed—probably comet
92	6341	17 14.1	+43 15	Globular cluster
93	2447	7 40.5	—23 38	Open cluster
94	4736	12 46.2	+41 40	Spiral nebula
95	3351	10 38.7	+12 14	Spiral nebula
96	3368	10 41.5	+12 21	Spiral nebula
97	3587	11 9.0	+55 34	Planetary nebula—The Owl nebula
98	4192	12 8.7	+15 27	Spiral nebula
99	4254	12 13.8	+14 58	Spiral nebula
100	4321	12 17.9	+16 23	Spiral nebula
101	5457	13 59.6	+54 50	Spiral nebula
102	5866?	15 3.8	+56 9	Spiral nebula
102	5879?	15 7.2	+57 23	Nebula—The N. G. C. does not identify Messier 102
103	581	1 26.6	+60 11	Open cluster

This catalog is substantially according to J.F. Heard in *The Observer's Handbook for 1938* (The Royal Astronomical Society of Canada).

(continued from page 2)

ving and cataloging of these objects. Their telescopes were relatively crude, by modern standards, particularly lacking the facility and precision of present day mounting, not to mention the shortcomings of the metal used in making the mirrors which, upon tarnishing, necessitated the repolishing and refiguring of the mirror. Nevertheless, Sir John Herschel published in 1864 a General Catalogue of Nebulae which contained 5,079 objects. Of this number, the positions of all but about 450 were deduced from observations of the Herschels'. However, their observations often contained large accidental errors, arising from the manner in which their instruments were mounted and the consequent haste with which observations often had to be made. Dr. J. L. E. Dreyer published in 1876 for use in Lord Rosse's observatory in Ireland (which contained the then largest telescope in existence - - six feet in diameter) a list of corrections and a catalog of new discoveries. Ten years later he was commissioned by the Royal Astronomical Society to prepare a new, complete catalog. This appeared in 1888 as the *New General Catalogue of Nebulae and Clusters of Stars* (generally referred to as "N.G.C.") and has remained the standard reference work ever since. The

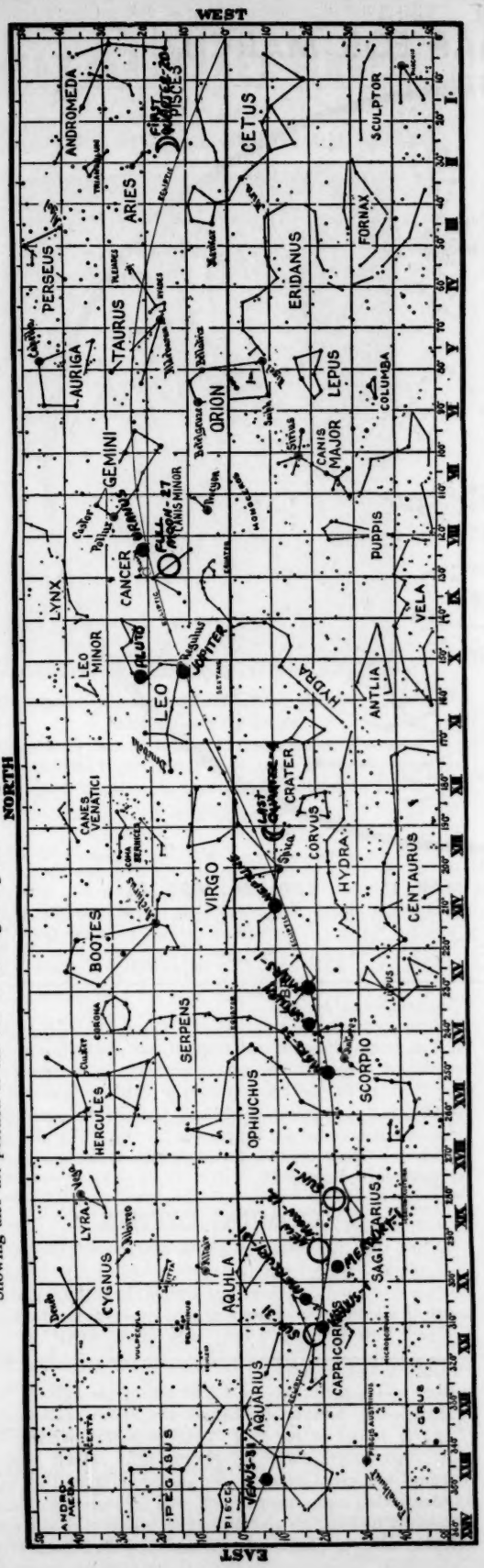
(continued on page 10)

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50° NORTH AND 50° SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50° NORTH AND 50° SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view. Practical as a Star, Constellation and Planet Finder for the current month—January, 1956—Anywhere in the world.
Showing also the position of the Sun at the beginning and ending of the month and the position of the Moon at its several phases.



MINIMA OF ALGOL, 1956

(Eastern Standard Time)

January	1—	6:03 am
	4—	2:52 am
	6—	11:41 pm
	9—	8:30 pm
	12—	5:19 pm
	15—	2:08 pm
	18—	10:57 am
	21—	7:45 am
	24—	4:34 am
	27—	1:23 am
	29—	10:12 pm
February	1—	7:01 pm
	4—	3:50 pm
	7—	12:39 pm
	10—	9:28 am
	13—	6:17 am
	16—	3:06 am
	18—	11:55 pm
	21—	8:44 pm
	24—	5:33 pm
	27—	2:22 pm
March	1—	11:10 am
	4—	7:59 am
	7—	4:48 am
	10—	1:37 am
	12—	10:26 pm
	15—	7:15 pm
	18—	4:04 pm
	21—	12:53 pm
	24—	9:42 am
	27—	6:31 am
	30—	3:20 am

Algol (Beta Persei) is an eclipsing binary variable star, shining normally at magnitude 2.2. Every 2 days 20 hours 49 minutes it fades to magnitude 3.5. Fading commences about five hours before the predicted times of minima given above; recovery to full brightness takes another five hours.

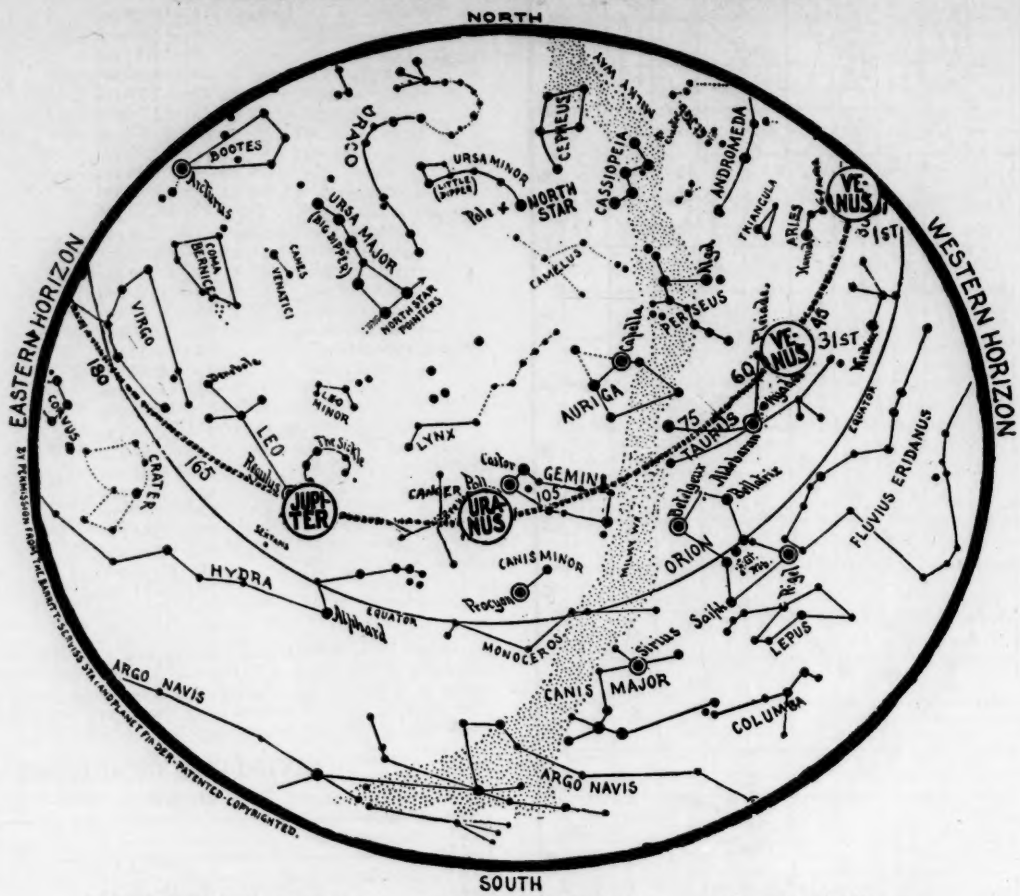
SATELLITES OF JUPITER

MARCH

Day	West																				East
1										○	2·	1·			4·	3·					
2							2·		·1	○	4·	3·									
3								4·	3·	○	1·										·2●
4				4·	3·					○			2·								·1●
5			4·			·3		2·	1·	○											
6		4·					·2			○		·1									·3●
7		·4					1·			○			·2	·3							
8			·4							○	2·	1·			3·						
9				·4	2·		·1			○			3·								
10								4		○	1·										·2●
11				3·				3	·○	1	·4	2·									
12	○1·			·3			2·			○				·4							
13						·2		·3	○	·1						·4					
14						1·			○			·2	·3				·4				
15									○		2·	·1			3·		4·				
16					2·		·1		○				3·			4·					
17							3·		·○	2	1·				4·						
18				3·				·1	○			2									
19	○1·			·3					4	○											
20					4·		·2	·3	○	·1											
21			4·				1·		○			·2	·3								
22		4·							○		1	2			·3						
23		4·				2·	1·		○				3·								
24	○3·		·4					·2	○		1·										
25				·4		3·		·1	○			·2									
26	○2·				·3	·4			○	1·											
27							·2	·3		·○	4										·1●
28								1·	○		·2	·3	·4								
29									○		·1	2·			·3	·4					
30							2·	1·	○				3·				·4				
31								·2	3 ○		1·							·4			

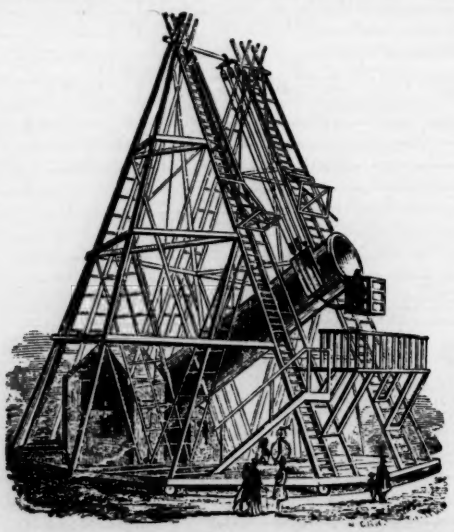
Appearance of Jupiter and its satellites at 12:15 A.M., E.S.T. as seen in an inverting telescope

EVENING SKY MAP FOR MARCH



AT 9:00 P.M., MAR. 1 8:00 P.M., MAR. 15 7:00 P.M., MAR. 31

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper. This map is arraanged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.



Sir William Herschel's forty-foot reflector. Completed in 1789, it had a four-foot metal mirror weighing about one ton. The telescope, with observer sitting in chair attached to upper end of tube, was adjusted in desired position by tackle.

(continued from page 3)

Perrine's comet has a period of six and one half years and it has been observed sufficiently that its returns can be predicted reliably. This is a relatively poor approach to the Sun as its distance from the earth is great and it, consequently, is faint. Perihelion passage, as computed by Hasegawa, occured on September 26, 1955; by the end of 1955 it is about 86,000,000 miles from the earth and its magnitude is around 10.

COMING EVENTS

Mars, that mysterious neighbor of the earth—one of the two planets aside from the earth which might be able to sustain life—will make an extremely close approach to the earth, a visitation in many ways the most favorable that can happen. Full details in a later issue of the MAP.

(continued from page 8)

places and descriptions of 7,840 objects are given. Subsequently, Dr. Dreyer published the *Index Catalogue of Nebulae found in the years* 1888 *to* 1894 covering 1,529 new discoveries, some by photography which was then coming into use. Curiously, the introduction to this volume contains the only mention of two clusters on Messier's original list, Nos. 25 and 48, which along with three other Messier objects (Nos. 40, 45, and 91) had been rejected

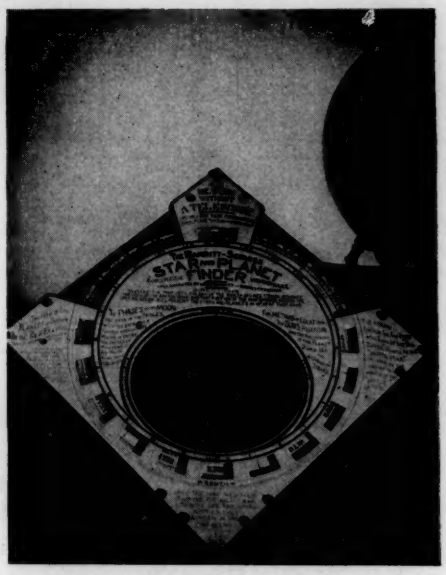
(continued on page 11)

THE BARRITT-SERVISS

STAR and PLANET FINDER

"The Heavens Without A Telescope"

A MOVING PICTURE OF THE UNIVERSE



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The Chart is 15 x 15 inches square and has a revolving disk map showing all the stars visible to the naked eye in the Northern Hemisphere, down to the 4th magnitude. The map is arranged specially for Latitude 40, North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.

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Make all remittances payable to "The Monthly Evening Sky Map".

(continued from page 10)

when the N.G.C. was compiled. A second *Index Catalogue* was published by Dr. Dreyer later, covering 3,857 additional nebulae and clusters found between 1895 and 1907, largely by photography.

Those of our readers who labor under the impression that nebulae and clusters can only be observed with elaborate and expensive equipment should get out their binoculars or small telescopes and try them on any item enumerated below, as well as practically any object on Messier's list. Take advantage of these long, transparent winter nights, and in the absence of moonlight, an amazing amount can be seen with the most modest equipment, let alone the naked eye. A telescope, such as a six-inch reflector, will do a remarkable job.

N.G.C. 224 (Messier 31)—The Great Nebula of Andromeda. A magnificent object, plainly visible to the naked eye. Amateur telescopes will reveal nebulosity, surrounding a bright central nucleus, covering an area as great as the full Moon. Of interest, also, are two nearby companions to the Great Nebula—N.G.C. 221 (Messier 32) a bright, round globular nebula, less than a half degree to the south. This can be seen in the same telescopic field if a low power is employed; and N.G.C. 205, a faint nebula which lies a little over a half degree north west of the Great Nebula.

N.G.C. 869 and 884—the famed Double Cluster of Perseus (see cut). Readily visible to the naked eye, it becomes a brilliant spectacle in a telescope. Composed of two loose clusters of bright stars, close together in the heavens.

Messier 45—The Pleiades, in Taurus (see cut). Six or seven stars can be seen with the unaided eye, many more in opera glasses or binoculars. It is possible to catch a glimpse of the nebulosity surrounding the brighter stars in small telescopes and under the best conditions.

N.G.C. 1976 (Messier 42)—The Great Nebula of Orion (see cut). Another object plainly visible to the naked eye. Involved in the nebulosity is the famous *Trapezium*—a quadrilateral of four main stars composing the multiple star, Theta Orionis. The nebulous area is very extensive and much can be seen in very small telescopes.

N.G.C. 2168 (Messier 35)—an imposing open cluster, a couple degrees north west of the stars Mu and Eta in Gemini, close to the ecliptic. For much detail, a telescope, rather than binoculars, is called for.

N.G.C. 2632 (Messier 44)—Praesepe, the fine open cluster of stars in Cancer. Readily visible to the naked eye, binoculars and small telescopes will resolve this misty patch of light into many individual stars.

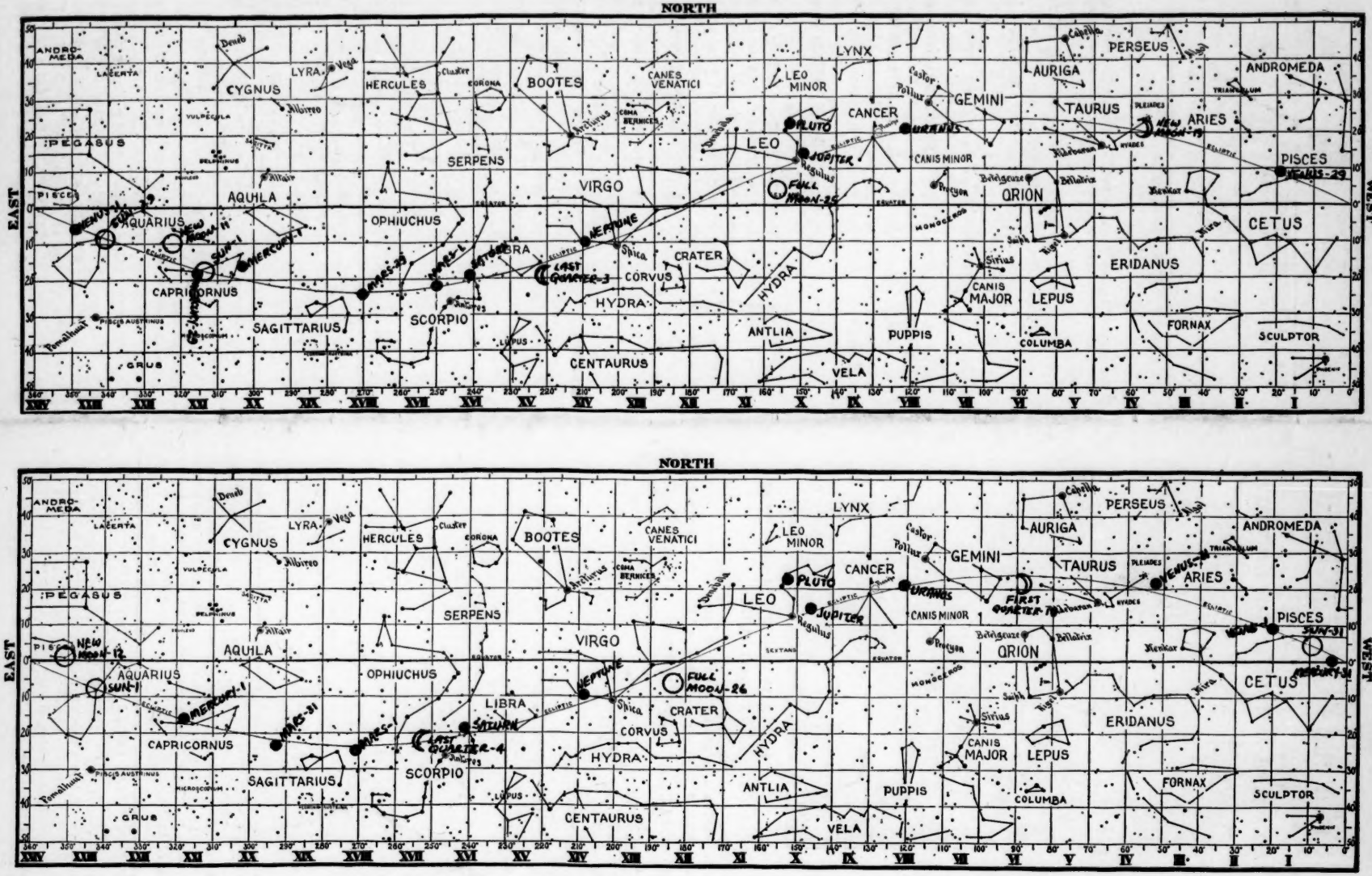
N.G.C.5272 (Messier 3)—a great globular cluster which can be seen with the naked eye. Located roughly half way between Arcturus and Cor Caroli, in Canes Venatici. While not so renowned as the Great Cluster in Hercules, it is, nevertheless, hardly less impressive. A medium sized telescope will resolve it into individual stars.

XUM

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50° NORTH AND 50° SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view. Practical as a Star, Constellation and Planet Finder for the current months—February-March, 1956—Anywhere in the world.

Showing also the position of the Sun at the beginning and ending of the month and the position of the Moon at its several phases.



Nov. 5 Oct. 22 Oct. 5 Sept. 20 Sept. 5 Aug. 20 Aug. 5 July 20 July 5 June 20 June 5 May 20 May 5 Apr. 20 Apr. 5 Mar. 20 Mar. 5 Feb. 18 Feb. 2 Jan. 20 Jan. 5 Dec. 20 Dec. 5 Nov. 20

THE DATE BELOW EACH NUMERAL WILL SHOW WHEN THAT SECTION OF THE MAP WILL BE ON THE MERIDAN—DUE SOUTH—AT 9 P.M. OR AN HOUR EARLIER FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.